

Aquifer Issues

Vulnerability

The Spokane Valley-Rathdrum Prairie Aquifer is highly vulnerable to contamination. Unlike many other aquifers, the Aquifer does not have protective layers of clay or rock to deter infiltration of surface contaminants. The soil layer above the Aquifer is relatively thin in most areas, and fluids readily infiltrate into the porous sands and gravel that comprise the Aquifer materials. Potential contamination is the most important Aquifer issue that must be addressed to preserve and maintain the Aquifer as a regional drinking water resource. A contaminant on the surface may reach the Aquifer water table in a matter of hours or days, particularly contaminants that are dissolved in water that is recharging the Aquifer. Once a contaminant enters the Aquifer it spreads into a plume. Different chemicals mixed with the water in the Aquifer create different plume behavior, and remedial actions must be customized to the specific contaminant. Contamination in the Aquifer may be cleaned-up, or remediated, but the clean-up process is costly and does not eliminate 100% of the contamination. Contamination prevention is the best strategy for protecting Aquifer water quality.

Contamination

Sources of contamination over the Aquifer are varied and abundant. Almost any activity that generates or stores waste material has the potential to contaminate an aquifer. Human-generated surface contamination has already reached the Aquifer, including: landfill leachate, industrial process wastewater, vehicle and tanker spills, and contaminated water from industrial and residential activities. Contamination incidents are costly and technically difficult to cleanup, and local agencies have learned that prevention efforts are much more cost effective than clean up. The most common contaminants found in the Aquifer are inorganic chemicals generated by normal everyday activities: nitrates, chlorides, sulfates and other chemicals that mix readily with Aquifer water. Industrial chemicals from past poor disposal practices and from landfill leachate have also created plumes in the Aquifer. These industrial chemicals (such as trichloroethylene, and gasoline components such as benzene) often create greater concern because their toxicity is generally much greater than inorganic chemicals.

Septic Systems

Studies from the 1980s indicated that about sixty percent of the pollution reaching the Aquifer originates from septic systems. The most common pollutant from septic systems is nitrogen, usually in the form of nitrate. Household chemicals dumped down the drain are not adequately treated in the septic tank and constitute another source of pollution from septic systems. Ongoing efforts in Spokane County and communities in north Idaho have connected many households and businesses to sewer collection systems, thereby reducing pollutants reaching the Aquifer and improving water quality. However in rural areas, septic systems will continue to be the only method of sewage treatment and disposal. These rural systems must be properly maintained to protect the Aquifer from further pollution.

Wastewater

Wastewater production is related to water usage, as most domestic and commercial water contributes to the wastewater stream. The Spokane River receives treated wastewater from several area wastewater treatment plants, and the river has reached its capacity for certain wastewater pollutants during the low flow summer months. An alternate wastewater treatment system is currently employed in north Idaho. During the growing season, a portion of the treated wastewater from the Hayden treatment plant is applied to crops on the Rathdrum Prairie. This method of wastewater treatment and disposal prevents further degradation of the Spokane River, and wastewater, rather than Aquifer water, is used to grow crops.

Stormwater

Stormwater accounts for about thirty percent of the pollution reaching the Aquifer. Stormwater can collect a large variety of contaminants as it flows across roads, parking lots, roofs and other impervious surfaces. Some of this water goes into dry wells without treatment. Both Spokane County and north Idaho now have regulations that require the use of grassed infiltration basins, also called grassy swales, that use natural processes to clean up the stormwater as it percolates through a grass and soil layer before making its way to the Aquifer.

Water Quality

The Aquifer is the most economical supply of drinking water for approximately 500,000 people in our region. The quality of the Aquifer water is high, yet water quality trends have shown a gradual increase of contaminants reaching the Aquifer. Our Aquifer is highly susceptible to pollution because of the porosity of the glacial gravels, shallow soils, and shallow water table. Pollutants such as coliform bacteria, nitrates, and volatile organic compounds have been detected in Aquifer water samples. These contaminants are seldom in concentrations high enough to exceed water quality standards and only occur in limited areas for short periods of time, since the high flow rate of the Aquifer tends to dilute pollution comparatively quickly. The trend of increased contamination indicates that we must protect the Aquifer from further contamination. Local governments, citizen groups and water purveyors have begun to reverse this trend by supporting and developing Aquifer protection programs and regulations.

Water Quantity

From its discovery over 100 years ago through the 1960s, the Aquifer was considered an “inexhaustible supply” of water. Approximately 219 million gallons were withdrawn from the Aquifer to supply the domestic needs of the area’s residents on an average day in 1999. However, on hot summer days the added water use for irrigation increases the daily Aquifer water withdrawal to over 680 million gallons. In our region daily household use can be as high as 600 gallons per day, while the national average is about 350 gallons per day. Future Aquifer water withdrawal must be carefully managed to prevent a draw down or depletion of the Aquifer reservoir. Maintaining the Aquifer reservoir is essential to maintain the health of the Spokane River during periods of seasonal low river flow.

Water Quality Testing

Both Spokane County and Panhandle Health District have ongoing monitoring programs to sample and test the Aquifer for contamination. About 60-70 wells scattered throughout the Aquifer are tested quarterly in Washington and three times a year in Idaho. The purpose of this testing is to monitor the overall quality of the Aquifer and to examine water quality trends. Very few contaminants have been detected in the water supply and those that are found are usually detected at levels far below drinking water standards. Nearly two hundred water supply wells at 100 locations are regularly tested to ensure the water supply meets health standards established by the federal government and state agencies.

Little Spokane River

At the western edge of the Aquifer, groundwater discharges into the Little Spokane River. The flow in the Little Spokane River is frequently below its desired minimum flow during the summer months, and the recharge from the Aquifer is an important contribution to this river. Similar to the Spokane River, the Little Spokane River supports a diverse plant and wildlife population, and Aquifer water is critical to maintaining this population.

Spokane River

In certain reaches, the Spokane River discharges to the Aquifer, and in other reaches the Aquifer adds water to the river (see page 15). The flow in the Spokane River during late summer is very low. During these low flow periods, much of the water in the Spokane River originates from the Aquifer, and this Aquifer water flowing into the river is very important for several reasons. First, the Spokane River supports a diverse plant and wildlife population, and the Aquifer water helps maintain the necessary habitat for these populations. Next, minimum river flows are necessary to dilute the treated effluent discharging from wastewater treatment plants at Coeur d’Alene, Hayden, Post Falls, Liberty Lake and the City of Spokane. Finally, water from the Aquifer helps the Spokane River meet State and Federal water quality standards.